

REMARKS

The present invention is a variable tumble-flow generating device of an engine. An embodiment of a variable tumble-flow generating device of an engine in accordance with the invention includes a bulkhead 3 for dividing an intake 13 into a first passage 5 and a second passage 7. An opening degree control valve 17 selectively changes an opening degree of the first and second passages. A driving means 11 operates the opening control valve. The bulkhead 3 includes portions along an edge of the air inlet facing end, as illustrated in Figs. 5-7, which comprise at least one protrusion and depression 25. The first passage 5 has a different cross-sectional area than the second passage 7 at the air inlet facing end. The inlet facing end as illustrated in Figs. 5-7 and the cross-sectional area of the first and second passages minimizes flow resistance through the first and second passages. See page 6, lines 5-22, of the specification.

Claims 1 and 10-11 stand rejected under 35 U.S.C. §102 as being anticipated by United States Patent 6,199,534 (Tokuyasu et al). These grounds of rejection are traversed for the following reasons.

Independent claim 1 recites:

A variable tumble flow-generating device of an engine comprising:

a bulkhead for dividing an intake port into a first passage and a second passage;

an opening degree control valve for selectively changing an opening degree of the first and second passages; and

driving means for operating the opening angle control valve; and wherein

the bulkhead includes portions along an air inlet facing end which comprise at least one protrusion and recess, the first passage has a different cross-sectional area than the second passage at the air inlet facing end with an edge of the air inlet facing end minimizing flow

resistance through the first and second passages.

and

Independent claim 22 recites:

A variable tumble flow-generating device of an engine comprising:
a bulkhead for dividing an intake port into a first passage and a second passage;
an opening degree control valve for selectively changing an opening degree of the first and second passages; and
driving means for operating the opening angle control valve; and
wherein
the bulkhead includes an air inlet facing end with grooves formed thereon, the first passage has a different cross-sectional area than the second passage at the air inlet facing end and edge of the air inlet facing end minimizes airflow resistance through the first and second passages.

Independent claim 1 recites that the bulkhead includes portions along an edge of the air inlet facing end which comprise at least one protrusion and recess, the first passage having a different cross-sectional area than the second passage at the air inlet facing end and the edge of the air inlet facing end minimizing flow resistance through the first and second passages and independent claim 22 recites the bulkhead includes an air inlet facing end with grooves formed thereon, the first passage has a different cross-sectional area than the second passage at the air inlet facing end and the edge of the air inlet end minimizes flow resistance through the first and second passages. Unlike claims 1 and 22, Tokuyasu et al's device has equal cross-sectional areas at the air inlet facing end and. Tokuyasu et al disclose neither the claimed at least one protrusion and recess along an edge of the air inlet facing end nor the edge of the air inlet end minimizing flow resistance through the first and second passages as recited in claim 1. Furthermore, Tokuyasu et al do not teach a bulkhead including grooves formed thereon, the first and second passages

having a different cross-sectional areas and an edge of the air inlet facing end minimizing airflow resistance through the first and second passages as recited in newly submitted claim 22.

Moreover, there is no basis in the record why a person of ordinary skill in the art would be led to modify the teachings of Tokuyasu et al to arrive at the subject matter of independent claims 1 and newly submitted claim 22.

Claims 1 and 10-11 stand rejected under 35 U.S.C. §102 as being anticipated by United States Patent 6,634,333 (Fujieda et al). Fujieda et al disclose a structure similar to that of Tokuyasu et al except that a rotary valve 12 is provided. The same differences as discussed above with respect to Tokuyasu et al exist with respect to Fujieda et al. Moreover, since the valve 12 is against the inlet facing end of the partitioning wall 10, the edge facing the air inlet does not minimize flow resistance as recited in independent claims 1 and 22.

Claims 2-9 stand rejected under 35 U.S.C. §102 as being anticipated by or alternatively obvious over Tokuyasu et al or Fujieda et al. The Examiner reasons to make the inlet facing end or outlet facing end of the bulkhead having a slant surface would have been an obvious matter of design choice in order to vary the flow of the air intake. This ground of rejection is traversed for the following reasons.

The Examiner has cited no justification in the record why such an obvious design choice would even be considered by a person of ordinary skill in the art. In fact, each reference is silent with regard to any effects of airflow caused by the inlet facing end or the outlet facing end. Moreover, with respect to the inlet facing end of Fujieda et al, as stated above, it rides against the rotary valve 12 which precludes it

from even having any effect on airflow resistance at the intake. Accordingly, it is submitted that the rejection of claims 2-7 is erroneous and should be withdrawn.

Newly submitted claims 23 and 24 recite that a cross-sectional area of the first and second passages and the edge of the air inlet end provide a flow of air which minimizes airflow resistance through the first and second passages which it is submitted is neither anticipated nor rendered obvious by Tokuyasu et al or Fujieda et al.

In view of the foregoing amendments and remarks, it is submitted that each of the claims in the application is in condition for allowance. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (1143.41026X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



Donald E. Stout
Registration No. 26,422
(703) 312-6600

Attachments

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